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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

NEWS LETTER

FOR SEPTEMBER 1937

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LEON HOWARD WORTHLEY

Leon Howard Worthley, in charge of two of the Bureau's most extensive control campaigns, the eradication of the Dutch elm disease and Japanese beetle control, with headquarters at Bloomfield, N. J., died on October 9 at Montclair, N. J., after an illness of several months. His wife, Mrs. Harriette Worthley, survives him.

Mr. Worthley was born in Skowhegan, Maine, in 1877. He attended public school at Skowhegan and at Lynn, Mass. Before entering the Government service in 1912, he had been a scout employed by the Massachusetts State Board of Agriculture for the eradication of the gypsy moth, a general contractor for the eradication of brown-tail and gypsy moths, local moth superintendent of Saugus, Mass., State agent in charge of gypsy and brown-tail moth work for 30 cities and towns in Massachusetts, and assistant State superintendent of gypsy and brown-tail moth work for Massachusetts.

In 1919 Mr. Worthley was assigned to the European corn borer control and regulatory work of the Bureau of Entomology. In 1927 he was given charge of an intensive corn borer campaign, for which Congress appropriated $10,000,000. In 1930 he was given the job of administering the Japanese beetle quarantine and went back to New England to establish joint headquarters there for the two activities. Later, the tremendous task of eradicating the Dutch elm disease was added to Mr. Worthley's other duties.

E. G. BREWER NAMED HEAD OF JAPANESE BEETLE CONTROL AND DUTCH ELM DISEASE ERADICATION

Erle G. Brewer has been appointed to succeed Mr. Worthley as leader of the Japanese Beetle Control and Dutch Elm Disease Eradication Division. Mr. Brewer has been associated with the work of the Division he now heads almost continuously since 1906.

WHITE ARSENATES TO BE COLORED PINK

W. N. Watson, secretary of the Manufacturing Chemists' Association, has advised the Bureau that the members of the association have voluntarily agreed to adopt a pink color for all white arsenates and that all of the materials produced for the coming season will be colored pink. This color will be used for the calcium arsenate, lead arsenate, and magnesium arsenate, and, except for the stock which is now on hand, these standard insecticides will be colored pink.

NICARAGUAN LOCUST BONUS

A Managua, Nicaragua, cable to the New York Times says the government, in its warfare against locusts, which destroyed the greater part of the country's cotton, corn, and bean crops, yesterday began paying a bonus of 30 cents for a 5-gallon tin filled with the insects. Nicaragua recently passed a law providing for a package tax on all imported merchandise, the proceeds to be used to combat the locust plague.

LARGE SEIZURES OF UNFIT FOODS IN AUGUST

Federal authorities were active during the summer in rounding up food products that had been carelessly packed and handled, the current report of the Food and Drug Administration indicates. Seizures of perishable articles increased in number and canned, dried, and other processed foods continued to demand careful attention. Food products seized because of unwholesome condition included 60,000 pounds of moldy, dirty, and insect-infested prunes; 200 pounds of wormy, rancid, and decomposed walnut meats; 76 crates of maggoty blueberries and huckleberries; 1,760 sacks of weevily flour; 18 shipping cases of canned mustard greens containing insects; and 59 cases of apple butter containing insect particles. More food seizures in August involved 233 bushels of apples, 18 bushels of pears, 29 crates of cherries, and 39 crates of currants, all carrying dangerous quantities of spray residue.

FRUIT INSECT INVESTIGATIONS

Second-generation eggs of plum curculio below normal.--Studies conducted this year by O. I. Snapp and J. R. Thomson, Jr., of the Fort Valley, Ga., laboratory, indicated that the percentage of first-generation plum curculio that deposited second-generation eggs during the same year was less than usual. Thirty percent of the first-generation females failed to deposit second-generation eggs. No second-generation eggs were deposited in September.

Brushing peaches to remove lead residue.--Mr. Snapp reports that peaches sprayed this year with lead arsenate, according to the regular schedule, showed on analysis 0.022 grain of lead per pound of fruit before brushing. This was reduced to 0.013 grain by passing the fruit through a commercial brushing machine before shipment.

Notes on the Mediterranean fig scale.--C. K. Fisher, of the Fresno, Calif., laboratory, made records on the life history of Lepidosaphes ficus Sign. in the Fresno area from May through July 1937. Hatching of first-brood eggs had been observed to begin about April 23 and eggs of this brood were found until July 22, or 2 months after hatching began. Crawlers of the first brood had settled down by May 4 and winged males were seen on May 25. By June 1 eggs of the second brood were present and some had hatched by June 17. Many second-brood crawlers had formed scales by July 8. On July 21 approximately 75 percent of the eggs of this brood had hatched.

Colonization of Japanese beetle parasite.--J. L. King, I. M. Hawley, L. B. Parker, and M. H. Brunson, of the Japanese beetle laboratory at Moorestown, N. J., have reported on colonization of several strains of Tiphia popilliavora Roh., an imported parasite of the Japanese beetle. Of the adults of the Korean strain of material reared in the laboratory, part of the females were mated and used for further rearing of stock for colonization next year. The rest of the adult females were used for colonization purposes this season, four colonies being released in Delaware, three in New Jersey, and two in Pennsylvania. Local field-collected females of the Koiwai strain were used for colonization. In the continuously infested beetle area 20 colonies were released--8 in Delaware, 7 in Maryland, 2 in New Jersey, and 3 in Pennsylvania. In addition five colonies were released in Connecticut.

Distribution and abundance of Japanese beetle in area of continuous or general infestation.--T. N. Dobbins, Moorestown, reports that the area of continuous or general infestation in 1937 is tentatively estimated at approximately 13,851 square miles, an increase of 2,451 square miles over the estimate made in 1935. The distribution by States is as follows: New Jersey, 6,980 square miles; Pennsylvania, 4,358 square miles; Delaware, 946 square miles; New York, 858 square miles; Maryland, 664 square miles; and Connecticut, 45 square miles. Throughout the area of general infestation beetles were not generally as abundant in 1937 as during the preceding two seasons. The reduction, as indicated by foliage injury, was most marked throughout New Jersey and the immediately adjacent sections of eastern Pennsylvania, with the most striking reduction in north-central New Jersey, in Mercer, Middlesex, Somerset, and Hunterdon Counties. Throughout considerable parts of Maryland, Delaware, and eastern and southeastern Pennsylvania foliage injury was definitely not as heavy and extensive in 1937 as in the preceding year, particularly north of the Schuylkill River, although local areas of extremely heavy damage developed in parts of these States. Throughout the entire area the reduction in foliage injury appears to be closely correlated with the drought conditions that existed during the summer of 1936.

MEXICAN FRUIT FLY CONTROL

Still no Mexican fruit fly.--Continued hot and dry weather throughout September retarded the development of citrus fruit in the Rio Grande Valley to a marked degree. At the close of the month the fruit in very few groves would pass the State maturity tests and in general had failed to take on the customary size for this period of the year. It is believed that fruit in sufficient quantities will have passed the maturity tests by October 15 and that regular shipments will begin near that date. Trapping operations were continued but fewer specimens were taken than during any previous month this season. None of the specimens trapped was *Anastrepha ludens* Loew. The numbers of fruit flies identified in September are shown in the following table.

Species	Texas	Mexico
	Number	Number
Adults trapped		
Anastrepha serpentina Wied.--------	15	1
A. pallens Coq.----------------	64	0
Total------------------------	79	1
Larvae collected		
A. ludens Loew-------------------	0	12
A. serpentina--------------------	0	82
Rhagoletis sp.-------------------	0	23
Total------------------------	0	117

CEREAL AND FORAGE INSECT INVESTIGATIONS

Second brood of Melanoplus mexicanus Sauss. in Kansas.--W. T. Emery of the Manhattan, Kans., laboratory, reports that in collaboration with J. R. Parker, an experiment to determine the development of a second brood of *M. mexicanus* was begun in June at Manhattan. From 25 to 30 females, together with a similar number of males, were placed in a cage and fed green alfalfa for a period of 2 weeks. The old hoppers and their food were then removed. Observations were made to detect any appearance of newly hatched grasshoppers. It required from 17 to 27 days from the time the mature hoppers were placed in the cage until young hoppers of this species began hatching.

Corn-borer infestation in early market sweet corn in Ohio.--A. M. Vance, Toledo, Ohio, reports that over the period 1934-37, inclusive, there has been a steady increase in corn borer abundance in early market sweet corn near Toledo. All of the 25 fields examined in 1937 carried populations of over 500 borers per 100 plants, with an average of 794 borers per 100 plants. In these fields, practically 90 percent of the plants were infested, with an average of over 8.8 borers per infested plant. The following table gives a summarized comparison of corn borer infestation in early market sweet corn for the period mentioned.

Period of survey	Fields	Acres	Borers per 100 plants		Fields with average of over 500 borers per 100 plants
			Average	Maximum	
	Number	Number	Number	Number	Percent
1934, July 30-Aug. 8-	15	51	268	[1]358	6.7
1935, July 23-Aug. 9-	25	119	328	560	16.0
1936, July 28-Aug. 3-	25	114	469	990	24.0
1937, Aug. 5-Aug. 13-	25	116	794	1,294	100.0

[1] One exceptional field in 1934 had a population of 1,018 borers per 100 plants.

Oviposition of second-generation corn borer at New Haven, Conn.--Mr. Vance also reports that oviposition of second-generation moths in the New Haven district in 1937 was the heaviest recorded since the initiation of this type of study in 1934. The total numbers of second-generation masses, found on 200 plants in each of the 4 years, were as follows: 518 in 1934, (Hartford); 758 in 1935; 419 in 1936; and 1,420 in 1937. The average number of eggs per mass in 1937 and in 1936 was practically the same--17.9 and 17.8, respectively; in 1935 the average was 18.4. In 1937, 83.2 percent of the total oviposition had occurred by August 13, whereas in 1936, 64.9 percent had taken place by the same date. The data obtained on second-generation oviposition at New Haven in 1937 and in 1936, are presented in the following table.

Date	Accumulated egg masses on 200 plants	
	1937	1936
	Number	Number
July 24------	-	1
23------	-	5
31------	-	21
August 3-----	163	51
5-----	275	108
7-----	464	136
9-----	747	159
11-----	990	210
13-----	1,182	272
16-----	1,274	307
18-----	1,357	330
20-----	1,401	399
24-----	1,416	414
26-----	1,420	419

Field tests of sprays for European corn borer control.--D. D. Questel, Toledo, reports the favorable performance of various fluorine compounds applied to early market sweet corn in the vicinity of Toledo during the current season. These compounds compared favorably with ground derris. Although some of the fluorines caused considerable injury to plant tissue, the plants seemed to recover and by harvest time most of them produced large well-filled ears. Phenothiazine and the various nicotine combinations tested exhibited a relatively low effectiveness in these tests, possibly owing to the hardness of the water available.

Physiological effects of nutrients in food plants supplied the European corn borer.--G. T. Bottger, Toledo, reporting on progress of studies of the nutritional requirements of the corn borer, utilizing certain common weeds and crop plants as feeding media, indicates an important association between the chemical composition of these various media and their suitability as food for the larvae. Foods of relatively high carbohydrate content at time of feeding resulted in very favorable responses by the developing larvae, as measured by percentage of larval survival, average weight per borer, and rate of development determined by percentage of pupation at intervals of 30 and 40 days after hatching. In comparing the survival, on the internodes of the stalk between the different types and strains of corn, the differences between borer survival on the susceptible strain A X TR and the resistant strains Hy X R4 and Maize Amargo are most impressive. The survivals on either Hy X R4 or Maize Amargo amounted roughly to 75 percent of that occurring on A X TR. That pupation on Hy X R4 reached only 66.6 percent of that on A X TR and that the average weight of borers from Hy X R4 was only 78 percent of those reared on A X TR internodes also appears to be significant. That a nutritive difference exists between the two strains of corn seems further substantiated by the fact that only little more than one-third as many borers survived on the leaves of Hy X R4 as on those of A X TR, that the weights of the surviving larvae averaged only about three-fourths the weight of those from A X TR, that none of the larvae on the leaves of Hy X R4 pupated, but that nearly 14-percent pupation occurred among larvae on leaves of A X TR. While larval survivals on some other vegetable crop media have compared favorably with those in corn, higher rates of pupation are associated with development on various parts of corn plants than from any other medium. Pupation on sweet corn kernels reached 38.6 percent 40 days after hatching, as compared with a maximum of 12.5 percent on green beans under comparable conditions. Mechanical factors also contribute materially to borer development. Such conditions of food as heavy pubescence, hard, woody fiber, and unfavorable moisture content operate greatly to the disadvantage of the developing larvae, either on initial establishment or in the subsequent growth of those larvae that survive this initial period.

Biological differences in multiple- and single-generation strains of European corn borer.--K. D. Arbuthnot, New Haven, Conn., commenting on current progress of studies designed to establish possible biological differences between various "strains" of the European corn borer, reports that attempts to obtain mating when pairs of adults were placed in pint ice cream-container cages proved satisfactory. Mating, as evidenced by the production of fertile eggs, was obtained when five male and female moths were placed in pint cages. All combinations--multiple-generation males and females, single-generation males and females, multiple-generation males and single-generation females, and single-generation males and multiple-generation females--produced fertile eggs in these tests.

Summer parasitization of European corn borer.--E. D. Burgess, Moorestown, N. J., reports that field collections of corn borer larvae at Malden, Mass., show the definite establishment of *Phaeogenes nigridens* Wesm., a pupal parasite imported from Europe and released in the area prior to 1934. The total parasitization in the area surveyed was 8.75 percent, principally by *Inareolata punctoria* Roman, which, owing to undetermined factors, is the lowest summer parasitization that has prevailed since 1929.

European corn borer parasite emergence from imported and domestic material.--C. A. Clark, Moorestown, reports that the total emergence in the laboratory of European corn borer parasites for colonization purposes was as follows: *I. punctoria*, 10,979; *Lydella grisescens* R. D., 7,778; *Chelonus annulipes* Wesm., 2,032; *Labrorychus prismaticus* Nort., 180; and *Bassus agilis* Cress., 48.

Liberations of corn borer parasites in 1937.--C. A. Clark, Moorestown, states that 21,425 parasites of the European corn borer were released in 8 States in 1937, as shown in the following table.

State	Parasite species					Total
	Inareolata punctoria	Lydella grisescens	Chelonus annulipes	Bassus agilis	Labrorychus prismaticus	
Connecticut-----	--	1,987	1,183	-	-	3,170
Massachusetts---	575	-	-	-	-	575
Michigan--------	3,223	-	-	-	-	3,223
New Hampshire---	593	-	-	-	-	593
New Jersey------	593	270	450	20	61	1,394
Ohio------------	1,074	-	-	-	-	1,074
Vermont---------	2,279	-	-	-	-	2,279
Virginia--------	490	-	8,627	-	-	9,117
Total----	8,827	2,257	10,260	20	61	21,425

A total of 4,319 adults of *L. grisescens* and 1,257 *I. punctoria* were shipped to the parasite laboratory at Belleville, Ontario, Canada, for release in the area infested by the borer in that region.

JAPANESE BEETLE CONTROL

Inspection requirements for movement of farm products lifted.--With the lifting on September 22 of the seasonal restrictions on the movements of farm products from the regulated areas on account of the Japanese beetle, the services of many temporary inspectors engaged in this work were terminated. With the arrival of cooler weather, a decided increase in shipments of sweetpotatoes from the Eastern Shore of Maryland was noted. Virginia inspections were made up entirely of sweetpotatoes and, as in the case of Maryland, these shipments showed a decided increase since the first of September. A decrease in numbers of beetles in the Philadelphia, Pa., area permitted the elimination on September 11 of screening and intensive inspection requirements for refrigerator-car shipments. More huckleberries were certified from this area than for several years past. Shipments of the heavier crop picked this year extended over a longer period of time, ending late in September. Usually the season closes the latter part of August.

Nursery and greenhouse scouting for Japanese beetle results in reclassification.--Nursery and greenhouse scouting was completed in practically all areas before the middle of the month. In the New England sector 156 beetles were found within 500 feet of classified establishments and 103 beetles were found on the premises of 9 establishments that are either classified or requested classification. In the New York City area beetles were found on or within approximately 500 feet of 32 classified establishments and 1 sand pit. Twenty-seven of these establishments are located on Long Island. Rescouting of class III premises was conducted at six New York nurseries, all of which had a divided classification prior to June 15, 1937. Beetles were found in the class I and class III sections of one establishment and in the class III section of a second establishment. Fourteen establishments or nursery units in the vicinity of New York City received a class I status following negative scouting of their premises. Several establishments in the Virginia and District of Columbia area that had been given a provisional class III status earlier in the year were changed to class I after summer scouting failed to reveal any Japanese beetle infestation. Adult Japanese beetles were found in the vicinity of Elmira, N. Y., as late as September 24.

Soil treatment at Washington Birthplace National Monument.--Under the supervision of two men from the Japanese beetle control office, the heavily infested area found during the summer at the George Washington Birthplace National Monument, Wakefield, Va., was treated with arsenate of lead.

Trap scouting for Japanese beetle in nonregulated territory concluded.--Trap scouting in the nonregulated area for the 1937 summer season has been concluded. Traps were set in 417 towns and cities in 24 States. Results of trapping in 1937 disclosed 30 first-record infestations, 10 of which were in Maryland, 6 in Ohio, 4 in Virginia, 3 each in Illinois and West Virginia, and 1 each in Georgia, Indiana, New York, and Pennsylvania. Beetles were caught in 65 communities in which incipient infestations have been previously determined. Trapping in 322 cities and towns gave negative results.

Beetles still being found on cut flowers.--Cut-flower inspections increased somewhat in September. Over 100 beetles were removed from infested cut flowers in the Philadelphia, Pa., area. In most of the Syracuse, N. Y., area there have been only a few light frosts and this accounts in part for the continued movement of cut flowers in large quantities from this area.

Fall shipping season of nursery stock started.--Several cars of stock have already been certified for three of the larger establishments of New Jersey. Two of the largest rose growers in the Philadelphia, Pa., area are each budding 50,000 more roses this year than they did in 1936. These two growers together will have approximately 1,800,000 roses for sale this year.

Collections of Dutch elm disease suspects increased in New York State.--Scouts in Connecticut and New Jersey collected fewer specimens this scouting season than were taken in 1936. New York increased the number of collections by sampling all minor symptoms and all English elms. The numbers of suspects collected in the various States are given below.

State	Specimens taken in		Increase or decrease
	1936	1937	
	Number	Number	
Connecticut------	10,571	6,793	3,778 (minus)
New Jersey-------	25,722	22,036	3,686 (minus)
New York---------	15,913	37,406	21,493 (plus)
Outside States---	3,979	8,921	4,942 (plus)
Total-------	56,185	75,156	18,971 (plus)

Approximately 19 percent of the suspects collected in New Jersey during the 1937 foliar season were confirmed *Graphium*. In 1936, with approximately 3,500 more suspects submitted to the laboratory, the percentage was slightly higher.

Fewer diseased elms confirmed in 1937.--Systematic scouting for diseased elms has been concluded for the 1937 foliar scouting season. Approximately 1,825 fewer trees were confirmed as infected with the Dutch elm disease during the present scouting season than during the 1936 foliar season. Dates used for the comparison are May 30 to October 3, 1936, and May 29 to October 2, 1937. The numbers of confirmations in the various States are as follows:

State	Specimens taken in		Increase or decrease
	1936	1937	
	Number	Number	
Connecticut---	96	111	15 (plus)
New Jersey----	5,504	4,215	1,289 (minus)
New York------	1,699	1,136	563 (minus)
Outside States	22	35	13 (plus)
Total------	7,321	5,497	1,824 (minus)

Eradicated trees are larger this year.--It is surprising to find that the average diameter at breast height of 3,521 Dutch elm diseased trees eradicated in New Jersey this year is 15-2/3 inches. Last year the average diameter was approximately 11½ inches. From data available from an elm census made last winter in cooperation with the Morristown, N. J., laboratory, it was found that the average diameter of all elms was approximately 5 inches, and that less than 5 percent were over 15 inches in diameter. One of the largest trees eradicated this season was a 36-inch English elm, which was removed under a commissioner's order in Queens, N. Y. This tree exhibited only minor symptoms and was reconfirmed by culturing *Graphium* from two chips out of 59.

Autogiro scouting in protective zone.--Autogiro scouting assignments for the location of Dutch elm diseased trees in Marion County, Ind., Warren County, N. J., Rockland County, N. Y., and Northampton County, Pa., were completed during the month. In 71-1/3 hours of flying time, autogiro scouts in Sussex, Hunterdon, and Warren Counties, N. J., covered 404 square miles and located 239 individual and 15 groups of wilted elms. An autogiro scouting in Putnam and Rockland Counties, N. Y., covered 161 square miles in 50½ hours of flying time and spotted 100 suspects. In 35 hours of flying time, an autogiro assigned to the protective zone in Monroe and Northampton Counties, Pa., covered 186½ square miles and located 78 wilted elms. A total of 220 suspects were plotted on aerial township maps by the autogiro crew scouting in the Indianapolis, Ind., work area.

First cases of Graphium are confirmed in Redding and Weston, Conn.--First cases of diseased trees in the towns of Redding and Weston, in Fairfield County, Conn., were reported during the first 2 weeks in September. Weston was previously considered within the bounds of infection because of its geographical location. One new case was also confirmed in the town of Fairfield, in the same county. This is the first confirmation in this town since 1934.

Dutch elm disease survey in Indiana makes progress.--At the end of the September work period, the second survey of the entire diseased area plus approximately 3 miles of protective area in Indianapolis, Ind., were completed. Although the number of suspects collected continues to be high, no diseased trees have been located since the first week of August.

C. C. C. camps ordered to close.--Three C. C. C. camps assigned to Dutch elm disease work received tentative instructions to be prepared to close camp on September 30. These camps spent the last 2 weeks of the month bringing their work to an orderly conclusion and checking in tools and equipment preparatory to abandoning the camps.

Lumber shipments heavily infested with gypsy moth egg clusters.--Inspectors removed 78 clusters from 18 carload shipments of lumber consigned to points outside the New England area regulated on account of the gypsy moth. In addition, 59 egg clusters were removed from three shipments of second-hand lumber. Inspectors were somewhat surprised to discover a gypsy moth egg cluster on bittersweet, as this plant is seldom found to be infested.

Corn borer damage observed.--European corn borer infestations have caused considerable damage in central and southern Jersey. Cornfields totally collapsed, with populations as high as 43 corn borers per stalk, were observed by the Bureau's inspectors. Dahlia and gladioli growers are very much alarmed over the situation. Inspection of the establishments of 19 dahlia growers resulted in corn borer finds on all premises visited. This situation makes it imperative to carry on extremely close inspection on account of the European corn borer.

FOREST INSECT INVESTIGATIONS

European spruce sawfly in New England.--H. J. MacAloney, of the New Haven, Conn., laboratory, reports as follows on *Diprion polytomum* Htg.: "Approximately 1,250 acres of red spruce on the north slope of Mount Monadnock, N. H., was practically defoliated by the second generation of the European spruce sawfly and nearly 3,000 acres immediately surrounding this area are heavily infested. In several smaller areas in this general vicinity the infestation is heavy, but data indicate that elsewhere in the State the infestation is light. In Vermont there are two areas of heavy infestation where nearly complete defoliation occurs. One of these, covering about 2,000 acres, is on privately owned land near Wilmington; the other covers several hundred acres near Lincoln. The New York conservation department reports that no heavy infestations have been found in that State and that in some areas, at least, the infestation appears to be lighter than in 1935 or 1936."

Bark louse killing fir.--Mr. MacAloney reports that casual examinations of dying balsam fir, noticed during the spruce sawfly survey, indicate that the fir bark louse has increased in abundance since 1934. This is particularly noticeable in southern New Hampshire and in Washington County, Maine.

Wood borers damage lumber.--Mr. MacAloney reports as follows on wood borer damage to round-edged pine lumber: "Several requests for information on the prevention of damage to pine lumber by borers have recently been received. Examination of some of the stacks, containing six million feet, in a yard at Winchester, N. H., showed that most of the damage was in material sawed during the months of May, June, and July, when the *Monochamus* beetles are most active. Lumber sawed from October 1936 to January 1937 was only slightly damaged. The company was advised that square-edging the lumber or peeling the logs or lumber at a very slight additional cost would prevent attack."

Sawfly parasites liberated.--P. B. Dowden and P. A. Berry, New Haven, report as follows on the liberation of European spruce sawfly parasites: "On the 16th of September 500,000 more *Microplectron fuscipennis* Zett. were received from the Canadian parasite laboratory for liberation in the United States. They were liberated in colonies of 20,000 and 30,000 in the following general areas.

Place	Liberations	
	Colonies	Total parasites
	Number	Number
New Hampshire:		
Mount Monadnock	5	150,000
Temple	2	60,000
Stoddard	1	30,000
Vermont:		
Wilmington	11	170,000
Lincoln	3	90,000

"*Microplectron* has been recovered at three more of the 1936 liberation points, namely, Tupper Lake, N. Y., and two points about 6 miles apart on the road from Lac Frontiere, Quebec, to Churchill Lake, Maine. Large collections of cocoons of *Diprion polytomum* Htg. were made by members of this laboratory staff and local help at Dublin, N. H. (Mt. Monadnock). The material has been brought to New Haven where it is being sorted and cleaned for parasite-rearing work. It is estimated that about 300,000 cocoons were collected. A few specimens of a chalcid parasite, tentatively determined as *Chrysocharis laricinellae* Ratz., have been recovered from *Phyllotoma nemorata* Fall. liberation points at Eustis, Maine, and at Stark, N. H. Although *C. laricinellae* has been recovered from *Coleophora laricella* Hbn. in this country, this is the first recovery from *Phyllotoma*. Liberations were made at Eustis and Stark in 1935."

Scale on pitch pine.--T. J. Parr, New Haven, reports as follows concerning *Matsucoccus*: "Further counts on killing populations bear out the theory already advanced that it takes a larger population of scale to kill pitch pine shoots than it does to kill short-leaf pine. Twigs were selected at random and were not picked especially for heavy or light infestations on the different species."

A sawfly in New Jersey.--R. T. Webber, of the Morristown, N. J., laboratory, examined a pine planting at Oakland, N. J., on September 16 to obtain information concerning an infestation of a sawfly, *Itycorsia zappei* Roh. The planting was said to contain about 5 acres of *Pinus resinosa*. Nearly every tree had been completely stripped of its old foliage and on some trees the new foliage had been partially eaten. The trees were found to be vigorous, thickly branched, and averaged 12 to 15 feet in height. At the time the examination was made the larvae had ceased feeding and entered the soil under the trees. They apparently drop to the ground when through feeding and in burrowing into the soil rarely migrate beyond the limits of the crown of the tree. In order to obtain some data on the abundance of hibernating larvae, part of the soil under one tree was examined and the larvae found were counted. A total of 661 larvae were found and, as the area examined was about one-fourth the total area under the tree, Mr. Webber estimated the population of the total area as being approximately 2,600 larvae. Approximately one-sixteenth of the area under three other trees was similarly examined. Based on the number of larvae found under these trees, the number of hibernating larvae was estimated at 1,400, 850, and 1,050 per tree, respectively."

Chemicals to kill trees.--R. R. Whitten and W. C. Baker, Morristown, have reported on results obtained in an experimental plot at Springdale, N. J. Late in December 1936 and early in January 1937 copper sulphate in dry or liquid form was applied to the trunks of living elm trees in this plot. This was part of an experiment to determine how worthless elms can be killed and rendered unfit for bark beetle attack. During September 1937 trees that received the "dry treatment" and trees that received the "liquid treatment" were felled, cut into sections, the bark removed, and counts made of the galleries of *Scolytus multistriatus* Marsh. and *Hylurgopinus rufipes* Eich. present. The counts showed that neither treatment, applied late in

December and early in January, can be depended on to prevent bark beetle attack. Results from using copper sulphate in liquid form were much more satisfactory than when it was applied in dry form.

Outbreak of fir tussock moth in Colorado.--J. A. Beal, of the Fort Collins, Colo., laboratory, reports that Hemerocampa pseudotsuga McD. has recently been found responsible for the death of practically all Douglas and white fir over an area of about 200 acres near Colorado Springs. This is the first outbreak of this insect in Region 2 that has been brought to the attention of this office. An examination of the annual rings of trees in the infested area indicated that the insects have been concentrated there for the last 5 years, although the outbreak has subsided and no active insects could be found. Heaviest killing appears to have taken place from 1 to 2 years ago, with some loss of trees this year from bark beetles and other insects. Apparently this outbreak was suddenly brought to an end by some very important natural control agency, such as adverse weather conditions or a concentration of parasites; however, it is now too late to determine the cause of this sudden disappearance of the insects.

Bark beetle surveys in Rocky Mountain region.--According to Mr. Beal, it is doubtful whether outbreaks of the Black Hills beetle (Dendroctonus ponderosae Hopk.) have ever been more serious and widespread in the Rocky Mountain region than at the present time. As a result of this condition, extensive surveys have been undertaken on five different national forest areas in the region and for this work five crews of three men each have been employed to work under the direction of the Fort Collins laboratory. Most of these surveys are made from the middle of August until the end of October and are in ponderosa, limber, and lodgepole pine types. The survey of the Medicine Bow National Forest in Wyoming, already completed, revealed the presence of 10,876 new infested trees. The Roosevelt National Forest survey in Colorado, still in progress, indicates the presence of about 20,000 infested trees on this forest. The Denver Mountain Parks survey in Colorado, still in progress, shows about 10,000 infested trees. There are also about 10,000 new infested trees on the Bighorn National Forest in Wyoming, as shown by the incompleted survey. No figures are yet available on the Dixie National Forest in Utah, which is also being surveyed. In addition to the 50,000 newly infested trees on four forested areas, there is a known infestation of 200,000 trees on the Elk Mountain, Wyo., area, where no control work is being attempted. There are also heavy and uncontrolled infestations on both the Shoshone and Washakie National Forests and, worse than any of these areas previously mentioned, is the tremendous infestation on the Shoshone Indian Reservation in Wyoming which, in number of infested trees, undoubtedly exceeds the total of all trees on other infested areas in the region. We are undoubtedly undergoing a period very favorable for the building up of bark-beetle epidemics, and are therefore faced with the problem of combating these outbreaks on a wide front.

GYPSY MOTH AND BROWN-TAIL MOTH CONTROL

Summary of Federal gypsy moth work during the fiscal year 1937.--An average of 2,492 W. P. A. employees were engaged in Federal gypsy moth work during the fiscal year 1937 in Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, and Pennsylvania. These men scouted nearly 1,499,500 acres in open country; more than 1,316,200 acres of woodland; approximately 8,106,000 apple, oak, and shade trees; and over 11,250 miles of roadsides. During the course of this work they creosoted more than 2,217,700 gypsy moth egg clusters. Thinning and cleaning work was done on more than 7,500 acres and over 4,600 trees in open country were cut. Burlap bands were placed around more than 1,044,500 trees and resulted in the crushing of over 1,321,200 larvae and pupae. More than 13,200 woodland acres and 5,700 residential properties were sprayed, as well as over 65,200 trees in open country. In conjunction with the spraying work, nearly 586,700 feet of wire fence was erected, and 664,500 feet removed. The excess in the number of feet removed over the number erected is explained by the fact that wire is not removed in a locality if the same section is to be sprayed the following year.

Efficiency and economy of saw-dust machine demonstrated.--The saw-dust machine, which was tried out experimentally last year, has been operating in the field under actual working conditions for several weeks. The worth of the machine becomes increasingly apparent with each experiment. Recent tests demonstrated that waste brush and wood, properly cut and piled, can be disposed of much more rapidly by using the machine than by burning.

Scouting begun near Canadian border.--On September 20 a regular employee, thoroughly experienced in gypsy moth work, was transferred from Greenfield, Mass., to the eastern section of Washington County, Maine. He is supervising the work of several men with previous gypsy moth experience in intensively scouting the vicinity of gypsy moth infestations discovered in that territory during the last fiscal year. By the end of September this crew had completed a thorough examination of all tree growth within a half-mile radius of the infestation discovered last year in Topsfield, finding no new infestation, and moved to the site of the infestation found last year in Indian Township. The work in this section is being done in conjunction with similar work by employees of the Dominion of Canada, who discovered several small infestations a short distance east of this area in the Province of New Brunswick.

Gypsy moth work in Vermont concentrated in difficult areas.--Scouting in some sections of Vermont is difficult, if not impossible, during severe winter weather, and other parts of the territory cannot be traversed during periods of high water. Both types of terrain are now being scouted for the gypsy moth as rapidly as available labor permits, in order that the work in these regions may be pushed as far as possible toward completion before unfavorable weather begins.

New infestation found near assembling cage which recovered moths.--A gypsy moth colony has been found in the town of South East, in Putnam County, N. Y. About 30 egg clusters have been treated at this infestation, which is located about one-quarter of a mile from an assembling cage where three male gypsy moths were recovered last summer. The infestation apparently originated through the transfer of a portable building from Dover, Mass.

Gypsy moth infestation discovered by blister rust crew.--Employees of the New York State Conservation Department, engaged on pine blister rust control work, discovered gypsy moth egg clusters on Trumbull Mountain in the town of Hague, Warren County, N. Y. This town adjoins the barrier zone on the west. The employment of additional W. P. A. men has been authorized to do the intensive scouting and treatment work necessary in that area, in accordance with the Federal control program, which includes the complete eradication of all gypsy moth infestations in or west of the barrier zone.

State gypsy moth inspection work increases in Pennsylvania.--Reports of violations of the State quarantine regulations relative to the movement of forest products in the gypsy moth infested area of Pennsylvania, by inhabitants who have started to cut their winter supply of wood, are increasing. Many of the people apparently have no knowledge of the regulations, as investigations have shown that most of those reported are first offenders. The demand for light scrap metal, such as automobile fenders and bodies, has increased in the Scranton district. Much of this material is picked up in fields and dumps near trees and shrubs favorable for the development of the gypsy moth and must be closely inspected before movement can be permitted. Inspection work is further increased by the large Wyoming Valley coal companies, which are expanding their operations in preparation for winter. This results in materially increasing shipments of mine timber, especially in the region of Penn Forest, Kidder, and Foster Townships. All of this timber must be inspected before it is moved.

Unusual hazards of gypsy moth work in Pennsylvania.--Gypsy moth scouting work in Pennsylvania is progressing satisfactorily, despite various difficulties encountered by the men in certain parts of the area. Rattlesnakes are seen daily in the mountainous areas, but they are becoming more sluggish as cold weather approaches. It has been necessary to modify the method of scouting of the crews in Barrett Township, Monroe County, because of the loose stones and boulders strewn on the precipitous slopes, endangering the workers. Numerous nests of wasps and hornets have been disturbed by workers engaged in knocking off sprouts and many of the men have been severely stung. The workers in one section were fortunate enough to find a blue-tinted clay which materially relieves the pain and reduces the swelling, when applied to the parts affected.

New infestations found in Vermont east of the barrier zone.--Six small gypsy moth infestations were found in the town of Ludlow, Windsor County, Vt. Five of them were single-egg-cluster infestations, and the other contained two egg clusters. Each of the locations will be scouted intensively after the foliage falls and the egg clusters become more clearly visible. These infestations are located farther west than any others found by C. C. C. enrollees in Vermont, but are a considerable distance east of the barrier zone.

Comparison of C. C. C. gypsy moth burlapping work in 1936 and 1937.--Burlapping work done by C. C. C. enrollees was completed on September 4. Less work of this type was done during the fiscal year 1937 than during 1936,

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as fewer men were available for gypsy moth projects. In 1936, 2,104,157 trees were burlaped in 80 different towns, resulting in the destruction of 21,973,303 gypsy moths. In 1937, 1,796,066 trees were burlaped in 60 towns and 13,561,936 gypsy moths were destroyed.

Practical demonstrations of work at gypsy moth field meeting.--Approximately 80 persons attended the gypsy moth field meeting at Westfield, Mass., on September 2. These included 11 C. C. C. camp superintendents; 32 C. C. C. gypsy moth foremen; 15 men from the regular Federal gypsy moth organization; 10 foresters who were Federal, State, and C. C. C. officials from Vermont, Massachusetts, and Connecticut; and State officials in charge of gypsy moth work in the same 3 States. Several of the gypsy moth foremen manifested their interest by interrupting their vacations and attending the meeting at their own expense. The day was begun with a short indoor meeting at which C. C. C. gypsy moth work and certain phases of silvicultural work were discussed. Practical demonstrations of the work were shown during a trip to four points in the field.

PLANT DISEASE CONTROL

Costs of salt and brine treatments in West Virginia.--Tom Van Zanden, in charge of barberry eradication in West Virginia, reports as follows concerning comparative costs in treating barberry bushes with dry-salt and salt brine: "In an effort to determine comparative costs of the dry salt and the salt-brine treatment as a general field practice in barberry eradication, a practical test was made over a period of 4 hours, or ½ day. The experiment was conducted under almost identical field conditions using four laborers and one subforeman, or 20 man-hours of labor, to each group of workers. It was found that at a salary of $8.76 for labor, the cost of transporting materials to the eradication site when working with salt solution is approximately 100 percent more than the cost of transporting materials for the dry-salt treatment. The dry-salt treatment for 3½ square rods required 1,308 pounds of salt, at a cost of $5.10, whereas the salt-brine treatment for 12½ square rods required 875 pounds of salt, at a cost of $3.41. It was found that considerably more was accomplished with salt brine, at less cost for materials. The actual cost of eradicating 6,670 barberry bushes with dry salt was $13.86, or $0.0021 per bush. The cost of eradicating the same number of barberry bushes with brine would be $3.34, or $0.0005 per bush. Therefore, the practicability of salt brine over dry salt rests entirely on the item of transportation. The cost per bush will vary, depending on accessibility of water used in making the salt brine."

Progress of work in Colorado.--E. A. Lungren, in charge of barberry eradication in Colorado, submits the following report relative to the progress made in eradication since emergency money became available in August 1935: "Progress made in barberry eradication in Colorado with crews of security-wage earners since August 1935 is summarized in the following table.

County	Area covered	Properties cleared	Bushes destroyed [1]	Relief labor	Nonrelief labor	Men employed season 1937
	Square miles	Number	Number	Man-months	Man-months	Number
Adams	468	-	-	8.04	3.00	-
Arapahoe	5	1	1	-	-	-
Archuleta	216	13	156,858	336.15	20.50	49
Boulder	288	4	11	7.57	2.50	-
Conejos	144	6	82,200	192.74	5.50	23
Denver	50	1	2	3.85	2.58	6
Douglas	504	1	4	24.50	3.52	-
Fremont	432	2	5	13.16	2.25	-
Huerfano	1	1	1	-	-	-
Jefferson	15	1	1	-	-	-
La Plata	684	125	2,156,642	1,287.59	22.68	99
Larimer	324	7	202	33.03	2.00	-
Morgan	468	1	1	31.90	2.50	-
Pueblo	756	3	11	47.36	4.51	-
Rio Grande	396	19	765,174	492.57	20.55	31
Weld	1	3	5	-	-	-
Total	4,752	188	3,161,118	2,478.46	92.09	208

[1] By the use of 112.82 tons of salt and 6,550 pounds of Atlacide.

"Of the 16 counties listed, 4 (Archuleta, Conejos, La Plata, and Rio Grande) comprise the large areas of native barberry. The others contain large areas of Berberis vulgaris. Informational work was carried on in two of the counties listed, namely, Huerfano and Weld. In the 14 counties surveyed, 4,750 square miles have been covered, 188 properties infested with barberry have been found, and 3,161,118 bushes have been eradicated."

A by-product of Ribes-eradication work in the Northwest.--In 1935, by means of the bulldozer method, 150 acres of "stream bottoms" were cleared of heavy Ribes concentrations in Squaw Valley, on the Kaniksu National Forest. This method involves the clearing of associated brush along with the Ribes. In 1935 a little additional work with a disk was done to improve the land for the sowing of grass. In 1936 this area was seeded to timothy, redtop, and clover. In 1937 an excellent stand of hay was produced on the area, and the Forest Service proceeded to harvest the crop for the feeding of their mules and horses, which are used for packing on the forest. Contracts were let for the cutting and baling of this hay at a cost of $8 per ton. The Forest Service had been paying $17 a ton for hay. With approximately 125 tons from the area, the net return for 1 year's cutting will be about $1,125. It is expected that the cost of the bulldozer work will pay for itself easily within 10 years, besides protecting some very valuable reproduction and pole stands of white pine. The cost of the bulldozer work was approximately $50 per acre.

Time required for black currant survey in Ohio.--The State leader of blister rust control in Ohio has recently checked his 1936 records to determine how rapidly his men could cover a county in their search for and destruction of cultivated black currants. He found that 1 black currant planting had been found for each 252 people in rural sections and 1 for each 556 people in urban districts. Counties having populations of less than 60 residents per square mile were covered at the rate of 3.9 square miles per man-day. Where the population was 64 to 122 per square mile, the men worked only 3.5 square miles each day. The other records were: Population 137 to 553 per square mile, coverage 1.73 square miles per day; population 843 to 2,954 per square mile, coverage 0.75 square mile per day.

Blister rust demonstration area.--The New Hope, Portage County, Wis., white pine blister rust infection area is not only serving as a splendid plot for infection-study purposes but is being used extensively for demonstration purposes. The area is an upland hardwood-pine type, typical of this Central Wisconsin forest type, and is reseeding to white pine in an extremely satisfactory manner. Young blister rust cankers were first observed in the area in 1935 and in the late fall of the same year 6 square chains (0.6 acre) were analyzed after the *Ribes* were eradicated from the entire area. The *Ribes* consisted mainly of *R. cynosbati*. In 1936 the 1,405 tagged trees, running from 6 inches to 10 feet in height, were again studied and it was found that of that number 208 had been killed by blister rust and 772 others were infected. The 1937 study is to be made this fall and in place of the dead trees it is planned to erect stakes 1 inch by 4 inches by 3 feet, with the bottoms creosoted, the tops painted white, and bearing a black stencil, "Blister Rust Killed a White Pine Tree that Stood Here." It is estimated that it will require almost 400 stakes to properly mark the white pine mortality on this plot.

Girl scouts aid in protecting white pine from blister rust.--On August 16 and 17 Miss Ruth Taylor and George C. Cramer took 11 Girl Scouts out for their first experience in white pine blister rust control work. Miss Taylor was Nature Counselor at the May Flather Girl Scout Camp located at Mt. Solon, Va., which is about 1/2 mile west of Stokesville, in the George Washington National Forest, where blister rust control crews were working. Mr. Cramer had charge of these crews. He explained to the girls how the rust infected the white pine and showed them blister rust on gooseberry leaves and on white pine. He then assigned eight girls as crewmen, two as checkers, and one as foreman. Each girl used a snake stick and uprooted the gooseberries by hand. In the 2 days the crew worked approximately 4 acres and uprooted 73 gooseberry bushes around their camp. On August 19 Miss Taylor brought 18 girls to an area near Reddish Knob, Va., where a regular blister rust crew was at work. They soon caught on to the way the regular blister rust crew worked, then formed a crew of their own and worked approximately 2 acres, uprooting 155 gooseberry bushes. While working in crew formation the girls discovered blister rust on gooseberry leaves, which aroused their interest more keenly than before. Miss Taylor, in commenting on this work, said: "I feel that the experience the girls had in working with Mr. Cramer in the control of blister rust was most valuable. Girl Scouts are much interested in conservation and the girls thoroughly enjoyed doing their tiny share in helping to save white pines, which they like so well."

COTTON INSECT INVESTIGATIONS

Soil animals and cotton root rot.--During the summer of 1936 investigations on the soil animals in root rot control plots were continued in the irrigated cotton areas at Sacaton, Ariz., by L. D. Christenson, of Tucson, Ariz., in cooperation with C. J. King, of the Bureau of Plant Industry. In the previous season's work it was found that heavy applications of organic material used for the control of cotton root rot had markedly increased the population of all the characteristic soil-insect groups and of mites. In 1936 the treatments of the plots were reversed. The plots that had received heavy annual applications of green or barnyard manures for 15 years were untreated, while the other plots were manured for the first time in 15 years. Quantitative studies of the soil fauna were undertaken to determine the initial effect of reversal of treatment on the populations. Soil samples were taken to a depth of 12 inches during June, July, August, and September from four plots receiving each class of treatment. The soil animals were extracted by means of Berlese funnels. When the first sample was taken on June 8 there was an exceptionally high population of 131 million mites per acre in the newly manured plots and only 30 million in the unmanured plots. Collembola were also abundant, with 12 million per acre in the manured plots and 22 million per acre in the unmanured. The spring application of manure had greatly stimulated the population of the mites, whereas the effects of 15-years' previous manuring still dominated the populations of Collembola. The other soil animals and insects were also more abundant at this time in the plots that had been manured for 15 years. These conditions changed, however, and by the end of the summer the pronounced increase in soil fauna brought about by the 15-years' manuring was entirely dissipated by 1 year of reversed treatment. A few forms such as Japygidae, Paurapoda, and two species of Collembola remained more abundant on the old manured plots. Samples from two other plots at Scottsdale, Ariz., manured for 3 years, and two plots at Coolidge, Ariz., manured for 1 year, were in general agreement with the results at Sacaton and indicate that improvement of soil structure and more abundant food supply brought about by manuring are responsible for the higher population densities in the manured plots. The 1936 studies corroborate the previous conclusions that control of root rot through manuring is achieved independently of the soil-animal fauna. The data do not indicate that the soil-inhabiting arthropods, together or separately, are responsible for root rot infection of cotton. In fact the opposite may be true, although the reasons are not obvious. It seems almost certain that the mycetophagous species are not numerous enough nor thorough enough in their feeding habits to reduce the root rot fungus to a noninfective quantity. If the soil animals do restrict root rot development, it may be due to their aid in the better distribution through the soil of microfloral organisms that inhibit root rot growth. In view of the meager information concerning the habits of arthropods living in the soil, such a statement must be made with reservations. The effect of the smaller soil animals on the growth of cotton seedlings was studied by planting cotton in heat-sterilized soil in flower pots. When the seed germinated representative populations of soil animals collected in the same kind of soil were added to half the pots. The initial growth of seedlings was faster in all cases in the soil containing the soil animals than it was in the defaunated soil. The increased initial growth in the faunated pots was possibly due to the inoculation of soil organisms with the arthropods, as final growth was better in the pots without the soil animals.

Toxicity of insecticides to cotton leaf worm.--The median lethal dosages of six commercial brands of calcium arsenate, paris green, mixtures of paris green and calcium arsenate, and lead arsenate for fifth-instar larvae of the cotton leaf worm were determined by R. C. Gaines, of the Tallulah, La., laboratory. A modification of the Campbell and Filmer sandwich method was used, in which a single cotton leaf dusted with a known quantity of insecticide was substituted for the "sandwich", because most larvae of this species would feed only on one leaf and would not eat through the double leaves. All larvae were field-collected, and were weighed before being starved overnight, to insure feeding within a reasonable time. Very few of the check larvae died within the 4 days they were kept under observation. The calcium arsenates used had previously been analyzed by the Insecticide Division and were selected on the basis of soluble arsenic, by the New York method. The analyses of the insecticides and the results of the tests of median lethal dosages of 10 insecticides for fifth-instar leaf worms are shown in the following table:

Insecticide	M.L.D. mg/gm body weight	Relative toxicity	Density (constant weight) cu. in. per lb.	A. O. A. C. method				New York method
				Total As_2O_3	Soluble As_2O_3	Total As_2O_5	Soluble As_2O_5	Soluble As_2O_5
Paris green (I.D.3673)----	0.01	43.0	--	58.4	2.33	--	--	--
Paris green (I.D.3673)10% and ca.ars. (I.D.3672)90% (I.D.3678)----------------	.05	8.6	--	--	0.38	45.4	0.10	--
Paris green (I.D.3673)7½% and ca.ars.(I.D.3672)92½% (I.D.3738)----------------	.12	3.6	--	5.06	--	44.7	.03	--
Ca. ars. (I.D.3672)--------	.43	1.0	66	--	--	43.5	.11	.40
Ca. ars. (I.D.3671)--------	.20	2.2	98	--	--	40.5	.14	.37
Ca. ars. (I.D.3737)--------	.21	2.0	98	--	--	42.1	.03	.86
Ca. ars. (I.D.3174)--------	.12	3.6	42	--	--	43.57	.18	11.5
Ca. ars. (I.D.3208) ------	.18	2.4	74	--	--	41.00	.11	6.0
Ca. ars. (I.D.3209)--------	.85	.5	48	--	--	43.14	.11	0.6
Lead arsenate (I.D.3674)--	.02	22.0	--	--	--	31.1	.22	--

Taking the M. L. D. (0.43 mg per gram of body weight) of the calcium arsenate I. D. 3672 as a standard of 1.0, the relative toxicity of the other four brands of calcium arsenate recommended for boll weevil control was from 2 to 3.6 times as great, while the special calcium arsenate (I.D.3209) was only half as toxic. The paris green was 43 times as toxic and the lead arsenate 22 times as toxic as the standard calcium arsenate against the leaf worms.

Varietal resistance of cotton to pink bollworm.--Studies on cotton varieties and varietal characteristics in relation to the pink bollworm, as reported by E. C. Ewing and S. L. Calhoun, of Presidio, Tex., indicate that earliness and productiveness are the most important characters that promote successful fruiting through evasion of a portion of the infestation. They also report that all varieties tested eventually became completely and more or less heavily infested, showing that there is no resistance to the pink bollworm in the complete sense of the word. However, studies indicate that a high lint percentage and a high lint index may be of some advantage in reducing or limiting the damaging effect of the pink bollworm on grade.

PINK BOLLWORM AND THURBERIA WEEVIL CONTROL

Gin-trash inspection.--Conditions have been very favorable throughout the month of September and, as a result, excellent progress has been made in gin-trash inspection. Some 10 crews have been working in north-central, west-central, and northwestern Texas; also in southwestern Oklahoma. Large quantities of trash have been inspected with negative results. Inspections were begun the first of the month in southern Alabama and Georgia and in northern Florida. Results have all been negative. A little laboratory inspection was carried on at one of the field stations. Some 2,600 green bolls were inspected with negative results. Last spring the city of Miami planted two small fields of cotton near Opa Locka, Fla., as an experiment. As this cotton began fruiting inspections were made from time to time, and the latter part of the month a living pink bollworm larva was found. Approximately 1,000 pounds of seed cotton had been picked, and when the matter was taken up with the proper officials this cotton was all destroyed by burning.

Destruction of stalks.--By the end of the month, at which time State regulations require that the destruction in the lower Rio Grande Valley of Texas of cotton stalks for control of the pink bollworm be completed, the stalks had been destroyed on approximately 95 percent of the cotton acreage. Most of the acreage remaining to be cleared is in the northern part of the district, in what is known as the dry-farming section. Excellent cooperation is being received throughout the district, and indications are that practically all of the remaining acreage will be completed within the near future. No infestation has ever been found in this dry-land section and the plants have stopped fruiting; consequently, the fact that they were not destroyed by the exact time set will not handicap the program in any way.

Road-traffic inspection.--The road-inspection station in the lower Rio Grande Valley of Texas was in operation throughout the month and made slightly over 200 confiscations. This is a reduction over the previous month, due to the fact that most of the pickers had left the area by the middle of the month.

Thurberia-plant eradication.--The destruction of Thurberia plants in the Santa Catalina Mountains of southern Arizona has gone forward as usual. The first part of the month was devoted to recleaning some of the area previously cleaned, working out from Tucson. By the middle of the month the new camp had been set up and thereafter work was carried on from this point. Some 1,200 acres were covered without finding any Thurberia plants.

Wild cotton.--The latter part of the month a survey was made to determine the status of wild cotton in southern Florida. Because of unfavorable weather the survey was not as thorough as had been planned and was confined to the mainland keys. It was found that, as a whole, the plants had made rapid growth since the last recleaning $3\frac{1}{2}$ months ago, and ranged in height from 1/2 inch to 5 feet. Blooms and small bolls were found on plants on two keys, and the larger plants in nearly all locations were squaring. The number of seedlings throughout the area is considerably less than last season.

TRUCK CROP AND GARDEN INSECT INVESTIGATIONS

Methods for control of tobacco flea beetle.--F. S. Chamberlin, of the Quincy, Fla., laboratory, reports that observations of experimental and commercial control operations against the tobacco flea beetle in 1937 justify the following conclusions respecting the control of these pests in the Georgia-Florida shade-grown tobacco district: (1) A dust mixture containing 1 percent rotenone is sufficiently toxic to control flea beetles on cigar wrapper tobacco in this district. (2) The best diluent for use on this specialized type of tobacco is sterilized, finely ground tobacco dust. (3) The dosage should be governed by the size of the plants. On newly set tobacco a dosage rate of approximately 4 pounds per acre should be sufficient, whereas large plants, nearing maturity, may require from 7 to 8 pounds per acre. (4) Although the duration of the efficiency of a rotenone-containing dust mixture for the purpose stated is limited to 2 or 3 days, under field conditions, applications made once a week should ordinarily protect the crop sufficiently. If a heavy rain follows an application, however, the treatment should be repeated. Under commercial conditions it is best to follow a definite dusting schedule during the principal part of the growing season. The attempt to time applications of the dust mixtures with flea beetle brood emergence seldom proves satisfactory. (5) In combating flea beetles on shade-grown tobacco, every effort should be made to keep the beetles in a state of continual subjection. Two procedures that assist greatly in this regard consist of the destruction of all tobacco stalks immediately after harvest and the application of rotenone-containing dust mixtures to the newly set plants immediately after they are transplanted.

Japanese iris tolerates heat treatment in delayed-planting experiment.--F. F. Smith, of the Beltsville, Md., laboratory, reports that Japanese iris plants held under conditions simulating transit for periods ranging from 7 to 10 days following treatment in hot water for 30 minutes at 110° F. to control the iris thrips (Bregmatothrips iridis Watson), grew just as satisfactorily as those planted immediately after treatment. In the course of this experiment half of the divisions of the iris were planted immediately after treatment, whereas the others were packed as for shipment, held for periods ranging from 7 to 10 days, and then planted. The foliage on the plants which were not set out immediately yellowed slightly and the new growth varied considerably in volume, but the foliage developed satisfactorily during the year and was approximately equal to the iris planted immediately after treatment.

Poison baits control mole crickets on golf courses in Florida.--J. N. Tenhet, of the Sanford, Fla., laboratory, reports that satisfactory results in the control of mole crickets (Scapteriscus spp.) on golf courses have been obtained with a poisoned bait consisting of wheat bran, cottonseed meal, molasses, and calcium arsenate, in the proportion of 50-50-1-7, applied at the rate of 5 pounds (dry weight) per 2,500 square feet. This bait was broadcast late in the afternoon every 3 days for 2 weeks. At the end of this period it was estimated that the area of the golf courses showing evidences of mole cricket burrows had been reduced at least 90 percent and the use of the bait did not cause any injury to the grass.

Relative effectiveness of three insecticides against southern armyworm.--As a result of laboratory tests with a precision duster, C. B. Wisecup, Sanford, reports that three poisons--calcium arsenate, synthetic cryolite, and phenothiazine--used at three dilutions (1-1, 1-5, and 1-15) with two different diluents (sulphur and clay) and applied at two distinct dosages (1/40 and 1/20 g per application) against newly hatched and quarter-grown larvae of *Prodenia eridania* (Cram) showed the following: (1) While calcium arsenate was distinctly the most toxic material, phenothiazine was as good as synthetic cryolite with the quarter-grown larvae, much better than synthetic cryolite and almost as good as calcium arsenate with the newly hatched larvae. (2) There were only slight differences in mortality between the 1-1 and 1-5 strengths of the better materials, but the 1-15 strengths were inferior. (3) The use of sulphur as the diluent had a tendency to give higher mortalities throughout the experiment than when clay was used. This result may have been influenced, however, because of the known tendency of sulphur to settle out faster than clay, giving this material a marked advantage under the technique used in these tests. (4) The use of the larger dosage gave a total greater mortality, but with the smaller larvae there was only a slight difference between more concentrated strengths of the better materials, indicating that either strength should be effective. These tests indicate definitely that phenothiazine should be investigated further as an insecticide for use against the southern armyworm.

INSECTS AFFECTING MAN AND ANIMALS

Sand fly larvae have long developmental period.--Observations made by J. B. Hull, of the Savannah, Ga., laboratory, indicate that under certain conditions sand flies may remain in the soil in the larval stage for almost 2 years. Recovery cages, kept in the same place on the salt marsh for several years and protected against adults getting into them and against migrations of the larvae into soil areas which they cover, continue to yield a few specimens of adult flies from time to time.

Size of solid particles that can be swallowed by fly larvae.--Studies on the feeding habits of blowfly larvae by F. C. Baker, Washington, D. C., show that certain species are able to ingest solid particles of considerable size. By mixing powdered charcoal with the food and later examining the contents of the crops of the maggots and measuring the size of the charcoal particles found therein, it was found that third-stage larvae of *Lucilia sericata* Meig. had ingested particles 87 by 50, 25 by 151, 87 by 99 microns in size, *Phormia regina* Meig. 50 by 63, 12 by 81, 43 by 81 microns, and *Sarcophaga securifera* Vill. 37 by 124, 50 by 62, 37 by 74 microns. These findings are of importance in determining the necessary fineness of insoluble materials used as larvicides against these species.

Insect predators destroy large numbers of screwworms in carcasses.--A. W. Lindquist, Uvalde, Tex., in further studies on the effect insect predators have in reducing the abundance of the screwworm fly (*Cochliomyia americana* Cushing and Patton) by destroying the larvae in carcasses of animals dying of screwworm infestations, has found that various species of ants are highly beneficial in this respect, as indicated by the following summary of data on the number of animals that died from screwworms, with percentage of emergence of flies.

Cases	Third-stage *C. americana* larvae when animal died	Emergence of *C. americana*	
Number	Number	Number	Percent
1936:			
7	9,400	753	8.11
1937:			
19	17,350	354	2.04
26	26,750	1,107	4.14
Cases in which carcasses were protected from ants			
7	3,044	2,892	93.03

Mr. Lindquist says: "The effectiveness of ants on *C. americana* larvae at carcasses appears to be due to the fact that ants find carcasses so quickly and are at hand to attack the migrating larvae. *Eciton caecum* Latr. has been the most frequently observed species at carcasses."

Eye gnats appear to be serious pests in Southeast.--In September a survey to determine the distribution, abundance, and economic importance of eye gnats (*Hippelates* sp.) in the area from Austin, Tex., to the southwestern part of Georgia was made by J. F. Bigham, of the Uvalde, Tex., laboratory. Mr. Bigham reports the following results of this work up to September 30, 1937: "By far the most strongly marked area of gnat infestation visited thus far is the section of southeastern Alabama and southwestern Georgia beginning about Troy, Ala., and continuing at least as far as Thomasville, Ga. In this area it is hardly necessary to inquire about gnats, for as soon as the truck is stopped they swarm into the cab in such annoying numbers that it is often necessary to get out of the truck in order to write notes. Other regions where there is considerable complaint about gnats are the strawberry-growing section around Hammond, La.; the section between Jackson and Waynesboro, Miss.; and several places in southeastern Texas. In the swampy sections of Louisiana there is much complaint about gnats, but there the situation is complicated by the presence of buffalo gnats and perhaps other kinds, so that one does not know how much of the blame to lay on *Hippelates*. At Taylor, Tex., gnats were reported to be very bothersome in the fields about cotton-chopping time in June. The Black Belt section of Alabama is distinctly a region of low gnat population. In general, gnats appear to be abundant in sandy regions and not abundant in black lands. This conclusion is derived both from personal observations and from what appears to be common knowledge of people living in the various sections. Sore eyes in children was reported as more or less prevalent almost everywhere. In southeastern Alabama and southwestern Georgia it is distinctly a seasonal plague (called 'gnat sore eyes'), corresponding to the season of gnat abundance but most prevalent among school children early in the fall. In other sections the disease is not distinctly seasonal, although it was often reported as worse in the fall or spring. Many cases of pink eye in livestock were reported between Jackson, Miss., and Montgomery, Ala. Southeastern Alabama and southwestern Georgia are said to be almost free from pink eye. At several places in the latter area it was reported that there had been no cases since there were some among cattle imported from drought-stricken areas in 1934."

FOREIGN PLANT QUARANTINES

Entomological interceptions of interest.--Living larvae of the West Indian fruit fly (*Anastrepha acidusa* Walk.) and of *A. suspensa* Lw. were collected on May 18 in 14 grapefruits in the field at Arecibo, P. R. Three living larvae of the yam weevil (*Palaeopus costicollis* Marsh.) were taken at Seattle, Wash., on July 21 in yams (*Dioscorea* sp.) in baggage from China. Living specimens of the scale insects *Fiorinia proboscidaria* Green and *Parlatoria ziziphus* (Lucas) were intercepted at Boston on January 25 on lemons in ship's stores from Java. Living adults of *Bruchus rufipes* Hbst. arrived at Mobile, Ala., on July 12 in vetch seed mixed with rye straw used as packing in cargo from Scotland. A living specimen of the Egyptian mealybug (*Icerya aegyptiaca* Dougl.) was taken at Philadelphia on January 6 on a croton plant in ship's furnishings from the Philippines. Adults of the hairy vetch bruchid (*Bruchus brachialis* Fahr.) arrived at Savannah, Ga., on August 21 in hairy vetch seed in cargo from Czechoslovakia. A living specimen of the Philippine orange moth (*Prays citri* Miller) was intercepted at San Pedro, Calif., on August 4 in a lemon in ship's stores from the Philippines. Living specimens of the scale insect *Diaspis simmondsiae* Ferris were taken at Nogales, Ariz., on June 28, 1936, on the gojoba nut (*Simmondsia chinensis*) in baggage from Sonora, Mexico. Four adults of *Bruchus luteicornis* Ill. arrived at New Orleans on June 25 in vetch seed in cargo from France. The vetch seed was mixed with rye-straw jackets used as packing for wine. Living specimens of the coccid *Chionaspis subnudatus* Newst., as determined from the original description, were intercepted at Washington, D. C., on May 7 on *Stapelea gigantia* var. *pallida* in the mail from the Union of South Africa.

Weevil in horseradish roots.--Living larvae of *Baris lepidii* Germar were intercepted at New York on April 28, May 11, and July 6 in horseradish roots in cargo from Czechoslovakia. Living larvae of this weevil were also taken at New York in horseradish roots in cargo on May 12 and in ship's stores on June 22 from Poland. This species is recorded from middle and southern Europe. It is associated in literature records with the following cruciferous plants: Watercress, horseradish, peppergrass, rape, turnip, and white mustard.

Pathological interceptions of interest.--*Anthostomella* sp., unlike the two species described on orchids, was found on *Oncidium speciosum* from Mexico on April 20 at San Francisco. An undescribed species of *Cladosporium* was found on croton leaves in baggage from Mexico on December [illegible], [illegible], at Laredo. *Diaporthe perniciosa* Marchal was intercepted on *Malus sylvestris* from Turkey in February at Washington. *Heterodera marioni* (Cornu) Goodey was intercepted at San Francisco on September 8 on *Anemone nemorosa* vars. Blue Bonnet and Royal Blue from Canada, and on September 15 on *Urbinia purpusii* from Japan. Our first interception of the genus *Leprieurina* was an undetermined species on an unidentified host from Jamaica on April 16 at New York. *Macrophoma* sp. with spores smaller than *M. paeoniae* Scalia was found on *Paeonia suffruticosa* from Japan on March 3 at San Francisco. *Microdiplodia passeriniana* (v. Thum.) All. and *Phaeochora chamaeropis* (Cke.) v. Hoeh. were intercepted for the first time on April 19 at New York on a palm leaf in a box of cipollini from Morocco. A trace of what appeared to be *Mycosphaerella calceoli* Kirschst. and Kirulis was intercepted on *Cymbidium giganteum* from India on April 28 at San Francisco. *Myxosporium* sp., apparently undescribed, was found on February 3 at San Francisco on *Paeonia moutan* and on March 3 on *P. suffruticosa* from Japan. *Peridermium* sp., no species reported on *Pinus halepensis*, was found on the needles of a specimen of this pine from Italy on May 6 at New York. *Phoma samararum* Desm. was intercepted on January 30 at New York on *Fraxinus excelsior* seed from Italy. Our first interceptions of *Phomopsis aucubae* Trav. were made at New York on January 17 on *Aucuba* sp. leaves from Sweden; on February 5 on *A. japonica* leaves from Italy; and on March 3 on *A. japonica* berries from Japan. *P. conorum* (Sacc.) Died. var. *naviculispora* Trav. was intercepted for the first time on February 27, on *Picea excelsa* cones from Germany. *P. laurina* Petrak, with spores smaller than description calls for, was intercepted on January 30 at New York on *Laurus nobilis* leaves from France. *P. tinea* (Sacc.) v. Hoeh. was intercepted on *Viburnum tinus* seed from Italy on January 30 at New York. Our first interception of *Sclerophoma strobiligena* (Desm.) v. Hoeh. was made at New York on August 31, 1936, on *Pinus mughus* cones from England. An undetermined species of *Sclerotium* was found on and in bulbs of *Lycoris radiata* from Japan on February 25 at Seattle. *Sclerotium* sp., associated with and thought to be a stage of *Aspergillus* sp., was found in caraway seed from Holland on March 30 at New York. *Sphaerulina oryzae* Miyake was intercepted for the first time on February 2 at New York on rice hulls from Japan. *Sphaerulina* sp., apparently undescribed, has again been intercepted on peonies from Japan (see News Letter for Oct. 1935, p. 23), this time at San Francisco on February 2 on *Paeonia moutan* varieties and on March 3 on *P. suffruticosa*. A rot in an apple from Tasmania intercepted at Philadelphia August 22 was found to be due to *Sporotrichum* sp., similar to forms found on apples and pears in this country. Our first interception of *Uredo behnickianum* P. Henn. was made on March 31 at Washington on *Oncidium* sp. from Panama. According to Arthur's manual, this rust has been found on orchids in a greenhouse in New Jersey but is not known to occur in this country now.

DOMESTIC PLANT QUARANTINES

White-fringed beetles found at New Orleans.--A light infestation of the white-fringed beetle (*Naupactus leucoloma* Boh.) was found at New Orleans on September 22 on an area of approximately 10 acres along the docks in the extreme southern part of the city. Only dead beetles were found. A very thorough inspection of the water front and railroad yards, covering approximately 5½ miles, has been made in the city of New Orleans.

Animal-bone inspection for white-fringed beetles.--Investigation is being made at New Orleans as to the possibility of animal bones, large quantities of which are shipped from Argentina and other South American countries, bringing in these insects, dead beetles having been collected in the vicinity of such importations at New Orleans. Several tons of imported bones were recently examined at the above port and some dirt was found adhering to them, indicating they had been on the ground for some time. Most of the bones entering this country from South America are reported to come from the packing houses where they have been boiled for fat removal, but since a boat load consists of 8 to 12 box-car loads, it is altogether probable the bones may have been exposed to infestation before being shipped. It is reported that some of these bones are collected from the prairies and are probably not treated before shipment. Bones having particles of animal matter adhering to them on entering this country are required by the Bureau of Animal Industry, we are informed, to be heated to 300° F. Most of the importations, however, consist of dry bones, which are permitted to enter without any type of inspection or treatment.

Other infestations of white-fringed beetle.--A general-to-heavy infestation of the beetles covering approximately 30 city blocks was found at Pensacola, Fla., on September 9, including a part of the Louisville & Nashville Railroad yards and residential and vacant property. Only one cultivated garden was found infected. At Laurel, Miss., additional infestations were found a mile south of the known infested area the week ended September 25, bringing the total area in this locality to approximately 1,200 acres. A quarantine was placed by the State, effective October 5.

Near Naupactus at Gulfport, Miss.--A relatively heavy infestation of insects similar to the white-fringed beetle, and identified as *Naupactus*, species undetermined, has been found at Gulfport over an area about 4 by 1½ miles, also an infestation in a settlement 4 miles north of the town and another at Saucier, 18 miles north of Gulfport, extending 2 miles along the railroad. The food plants and feeding habits of the insect are very similar to those of *N. leucoloma*.

White-fringed beetle population.--Although the adult beetle population is greatly diminished, 200 beetles were found on 1 velvetbean plant during the week ended September 18; 30 adults were found in the main barrier ditch on September 23; adults were plentiful on the ground in peanut fields the week ended September 25; egg masses have recently been collected from peanut fields and from this year's pecans on the ground; and larvae of various sizes have been found feeding on the roots and burrowing into peanuts. Chufa nuts were practically consumed. During the week ended October 2, 40 larvae, ranging in age from 10 days to maturity, were found under 1 peanut plant.

White-fringed beetle inspection.--Ten two-man crews are inspecting the leading seaports and other commercial centers in Alabama, Florida, Georgia, Mississippi, Louisiana, and Texas, centering their activities in areas near docks, railroad yards, mills, gins, and other points to which host material may have been transported. Intensive inspection is also being continued in the known infested areas for the purpose of determining the extent of infestation on all different types of properties. This work has resulted in determining that approximately 700 acres of uncultivated land in the Florala, Ala., area are infested, also 160 acres of woodland in Walton County, Fla., the beetles apparently having spread from cultivated properties.

Regulatory and control work on white-fringed beetle.--On finding that beetles were being transported in seed cotton and that living adults exist in gin trash and cottonseed after it has passed through the gin, it has been necessary to restrict the ginning of cotton from infested fields to three designated gins, and all seed from such fields is allowed to move to one approved oil mill for immediate crushing. Inspectors are stationed at the gins and the mill to supervise the handling of these materials. The Pensacola railroad officials and the health department of that city are furnishing labor for cleaning up the infested area, and similar work is done by managers of pulp mills and pine-products plants. A patrol inspector is checking the movement of quarantined products from the infested areas. Several lots of such products moving without certificates have been intercepted.

Sweetpotato weevil control and eradication.--Cooperative surveys conducted since July by inspectors of this Division and the affected States have resulted in finding the weevils in 22 counties in 4 States--1 county in Alabama, 12 counties in Louisiana, 5 in Mississippi, and 4 in Texas.

Peach disease control activities.--Inspection for the peach mosaic and phony peach diseases has been completed for the season in Alabama, Arkansas, Indiana, Illinois, Kentucky, Louisiana, Mississippi, New Mexico, Pennsylvania, and South Carolina. A third survey of the Moab area in Utah has been made in cooperation with the State and a third survey in the Palisade area in Colorado is under way. A resurvey in Texas and Oklahoma of all nurseries around which infestations have formerly been found, was recently completed and no infestation was found on the nursery stock. Such work is also going forward in Colorado, New Mexico, Arizona, and California. Trees are being removed in Alabama, Arkansas, California, Colorado, Tennessee, and Texas. In September the eradication force averaged 340 relief and 34 nonrelief persons.

Inspection for citrus canker.--Inspection and eradication of Citrus trifoliata in Florida, carried on by 1 inspector and 25 relief laborers, were discontinued at the close of the month. The Alabama work was carried on by 1 inspector and 30 laborers in September. In Texas, Brazoria County is again being inspected and tree removal is under way in Harris and Galveston Counties, permission having been obtained for such eradication at several locations where the property owners had previously opposed such removal.

Blister rust found in Illinois.--White pine blister rust was found in four counties on the northern Illinois border in a survey in September which covered the entire tier of northern border counties in both Illinois and Indiana and which was participated in by inspectors of the Divisions of Domestic Plant Quarantines and of Plant Disease Control and by an Illinois

State inspector. Two inspectors were assigned to each State. The disease was found on cultivated black currants on 14 locations in the counties of Lake, Boone, Winnebago, and McHenry. Red currants and wild gooseberries were also found infected. No rust was found in Indiana, after careful inspection of the two locations where the disease was found 2 years ago, and after a survey of six counties bordering on the infected State of Michigan.

CONTROL INVESTIGATIONS

Diet influences resistance of larvae to poisons.--While conducting tests on the toxicity of organic compounds, A. M. Phillips, of the Sanford, Fla., laboratory, has found that the food on which mosquito larvae are reared has a definite influence on the susceptibility of the larvae to poisons. In general, he finds that the most resistant larvae are those reared on a food causing a maximum rate of growth. Preliminary tests showed that larvae of the same age reared on a medium of yeast and milk were approximately 30 percent more resistant to standard dosages of nicotine and phenothiazine than were larvae reared on a medium of yeast and blood. This illustrates the necessity for standardized methods of rearing for toxicological studies.

Insects and different instars of the same insect vary in resistance to nicotine.--In work on the efficiency of nicotine gas as a fumigant, H. H. Richardson and A. H. Casanges, Beltsville, Md., found that the third-instar larva of the silkworm (Bombyx mori L.) was of about the same susceptibility to nicotine as the younger (second) and older (fifth and sixth) instars of the insect. Surprisingly, the silkworm larva has about the same susceptibility to nicotine gas as does the average aphid. The results of tests with the southern armyworm (Prodenia eridania (Cram.)) were quite different, however, the resistance to nicotine of the first-instar larvae being definitely greater than that of younger or older larvae of the silkworm. Resistance also increased very greatly in the later instars of the southern armyworm, the last stage being about the most resistant insect found. Evidently resistance to nicotine bears no relation to the size of the insect and it varies greatly between different insects and in some cases between different instars of the same insect.

INSECTICIDE INVESTIGATIONS

New insecticide.--D. L. Vivian and H. L. J. Haller have recently been granted U. S. Patent 2094031, which covers the use as insecticides of hydroxy azo compounds containing at least one hydroxy group and at least one nitro group. It was found that 4-(p-nitrophenylazo)-resorcinol, when added to water at the rate of one part to 300,000 parts of water, forms a solution that kills more than 50 percent of culicine mosquito larvae within 16 hours. Another compound belonging to this class, namely 1-(p-nitrophenylazo)-2-naphthol, kills more than 90 percent of culicine mosquito larvae within 16 hours at a concentration of 1 part to 25,000 parts of water. It is believed that these compounds will prove highly effective against many of our worst insect pests.

BEE CULTURE

Japanese pagoda tree, Sophora japonica, yields nectar at Beltsville, Md.--C. E. Burnside, Beltsville, reports that a mature Japanese pagoda tree bloomed profusely on an abandoned farm in the Biological Survey game preserve at the National Agricultural Research Center. Both honeybees and wild bees visited the tree in such large numbers that their humming was clearly audible several rods from the tree. The honeybees were observed to enter the blossoms for nectar, and most of their activities seemed to be nectar gathering. It was not determined whether they were also gathering pollen. This tree is rare in the United States. It would apparently find favor as an ornamental tree, if more widely known, especially because of its late-blooming habit.

IDENTIFICATION AND CLASSIFICATION OF INSECTS

Valuable additions to collection of coleopterous larvae.--J. P. Kryger, of Copenhagen, Denmark, has sent to A.G. Böving for deposit in the collections of the National Museum coleopterous larvae of 44 species, all specifically determined by rearing, and including 11 species new to our collection. Brief biological notes accompany the specimens. This represents Mr. Kryger's annual gift of such material. For approximately 20 years he has been contributing regularly to our collections of identified coleopterous larvae, as a result of long personal friendship with Dr. Böving. Dr. Böving also reports the receipt of valuable reared coleopterous larvae from Peter C. Ting, of the California Department of Agriculture. Included are specimens of 13 species not previously represented in our collections.

Correct name for West Indian fruit fly.--It has become apparent that the commonest West Indian fruit fly, usually going under the name of *Anastrepha acidusa* (Walker), is not this species. It, therefore, becomes necessary to use another name. Sein in 1933 described the species under the name *Anastrepha fraterculus* var. *mombinpraeoptans*. It is, however, specifically distinct from the common South American *A. fraterculus* Wied. and should therefore be called *A. mombinpraeoptans* Sein. The name *acidusa* was applied to this species on the basis of a specimen in the National Museum collection bearing the label "Compared with type of *acidusa* Wlk. in British Museum by L. O. Howard, 1912." It was assumed that the specimen agreed, but recently it has been learned that C. V. Hooker, who collected the specimen, wrote in 1913: "This was first determined as *A. acidusa*, but comparison by L. O. Howard with the type of this species in the British Museum shows that the mango fruit fly is a different species, possibly undescribed." John Smart, of the British Museum, has compared a number of specimens of *mombinpraeoptans* from Jamaica, the type locality of *acidusa*, with the type of the latter species and declares them certainly to be not the same. The most striking difference is in the length of the ovipositor sheath, which in *acidusa* is 3 mm long, instead of less than 2 mm, as in *mombinpraeoptans*. No specimens have been found which agree with the type of *acidusa* and the species remains unknown except for the unique type. Miss Daphne Aubertin, L. O. Howard, and Dr. Smart have all studied the type of acidusa and have declared it to be different from the common West Indian species.

Additional United States record for a European sawfly.--Several specimens of sawflies recently submitted by J. S. Houser, Ohio Agricultural Experiment Station, Wooster, Ohio, and taken from mugho pine at Sidney, Ohio, were identified by Grace A. Sandhouse as *Neodiprion sertifer* (Geoffroy). This is the second record of the occurrence of this Palearctic species in the United States, the other being from the same host at Somerville, N. J.

Ants as food of armadillos.--M. R. Smith has identified a quantity of ants submitted by the Bureau of Biological Survey and reported as having been found in the stomach contents of armadillos in Texas. The following 13 species and forms of ants were represented: *Pheidole dentata* Mayr, *P. dentata* var. *commutata* Mayr, *P. metallescens* subsp. *splendidula* Whlr., *Xiphomyrmex spinosus* subsp. *insons* Whlr., *Eciton caecum* Latr., *E. schmitti* Emery, *Solenopsis xyloni* McCook, *Leptogenys elongata* Buckley, *Trachymyrmex septentrionalis* McCook var., *Ponera opaciceps* Mayr, *Monomorium minimum* Buckley, *Crematogaster laeviuscula* var. *clara* Emery, and *C. victima* subsp. *missouriensis* Perg.

Ants injure cabbage seedlings.--In September M. R. Smith received for determination from W. A. Thomas, of Chadbourne, N. C., some workers of a species of ant said to "have been particularly destructive to seedling cabbage" during the preceding month. The ants were identified by Mr. Smith as a species of *Pheidole*, apparently *P. vinelandica* Forel.

Living specimen of a tropical orthopteron taken in Washington.--A. B. Gurney reports that an interesting specimen recently added to the Museum collections is an adult female of *Polyancistrus atlas atlas* Rehn, found alive in bananas in a Washington, D. C., grocery store. Although the source of the particular bananas is not known, it is very likely Haiti or the Dominican Republic, because this genus of Orthoptera is not known to occur elsewhere and bananas are grown on the island. The subfamily Pseudophyllinae, of the Tettigoniidae, to which *Polyancistrus* belongs, is poorly represented in the United States, the true katydid, *Pterophylla camellifolia* (F.), being the best known native species; the American tropics, on the other hand, are inhabited by several dozen genera. The species of *Polyancistrus* are of unusual interest because of the rarity of individuals, their restricted known distribution, and the heavily sclerotized, shieldlike prolongation of the pronotum which extends above the base of the wings. The typical race of *P. atlas* was previously represented in the National Museum collection by two specimens and is known only from the area about Port-au-Prince, Haiti.

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